Utah Department of Environmental Quality
Division of Solid and Hazardous Waste
Fact Sheet

SEPTEMBER 1999

Dioxins and Incinerators

Q: *What are dioxins?*

A: The term dioxins refers to 75 related chemicals of which seven are thought to be toxic. The technical name of the most toxic dioxin is 2,3,7,8-tetrachlorodibenzo(p)dioxin. The information presented in this fact sheet is focused on the toxic dioxins and dioxin-like chemicals such as furans.

Q: *What are dioxin-like chemicals?*

A: Dioxin-like refers to chemicals that have similar toxic effects as dioxins. The Environmental Protection Agency uses Toxic Equivalents to compare the potency of dioxin-like chemicals to the most toxic dioxin. For instance, a toxic equivalent of 0.1 means that the chemical is one-tenth as toxic as the most toxic dioxin. Dioxin-like chemicals include ten of 135 furans and 13 of the 209 polychlorinated biphenyls (PCBs).

Q: *Where do dioxins come from?*

A: Dioxins can be formed during the burning of substances containing chlorine. Dioxins have been detected in the emissions of municipal garbage incinerators, hazardous waste incinerators, automobile exhaust (leaded gas only), and the burning of wood in the presence of chlorine (for instance, burning of rain forests).

Dioxins are also formed during the manufacturing of some chemicals. Dioxins may be formed as an unintended byproduct when manufacturing herbicides, pesticides, wood preservatives, transformer coolant (PCBs), and germicides. Dioxins, when present in the waste burned in an incinerator, could be released if burning is incomplete.

In industrialized nations, dioxins are widespread. They have been detected in food stuffs, human tissue, and human breast milk. The widespread presence of dioxins can be attributed to their resistance to breakdown in both the environment and the body.

Q: *What is being done to control the amount of dioxins coming from incinerators?*

A: A large amount of research has been devoted to developing operating guidelines for incinerators that maximize the destruction of dioxins and minimize the amount of dioxins formed in the emissions. For the dioxins that are not destroyed, air pollution control equipment is designed to capture dioxins and prevent their release from the stack.

Q: *Are dioxins expected to be released from the Deseret Chemical Depot incinerators (TOCDF and CAMDS)?*

A: Yes, trace amounts. Dioxins are not in the chemical munitions to be burned (the Army is required to prove this) but some dioxins may be formed during the burning process. Based on the results of the smoke-stack monitoring at the CAMDS incinerators and the Johnston Atoll (JACADS) incinerators (in the South Pacific), very small amounts of dioxins may escape the sophisticated air pollution control equipment at TOCDF. Before TOCDF is permitted to begin full-scale operations, the smokestack emissions will be tested to verify that the amount of dioxins released will not be a threat to human health.

Q: *How are the Deseret Chemical Depot incinerators different from other commercial hazardous waste incinerators?*

A: In terms of the likelihood of releasing dioxins into the air, there is very little difference between the TOCDF and CAMDS incinerators and the Safety Kleen-Aragonite hazardous waste incinerator located in Tooele County. The incinerators have a similar capability to destroy dioxins and use similar air pollution equipment to capture the dioxins that might be formed during the burning process.

Q: *How can dioxins affect my health?*

A: In humans, exposure to high concentrations of dioxins may cause chloracne, a severe skin lesion that usually occurs on the head and upper body. Unlike acne, chloracne is more disfiguring and often lasts for several years after exposure. Dioxins may also cause liver damage, loss of appetite, weight loss, and digestive disorders. In animals, dioxins have impaired the immune system and caused an increase in spontaneous abortions and birth defects.

EPA has given a B2 classification to cancer-causing dioxins. The B2 classification indicates that there is sufficient data to know that dioxins cause cancer in animals, but the data is inadequate to know this about humans. In some animals, dioxins are one of the most potent chemical carcinogens known.

Q: *Are there other possibilities of health effects?*

A: Yes. The EPA is currently funding extensive research into the health effects of dioxins and dioxin-like chemicals. Scientists are investigating the possibility that chemicals, such as DDT, dioxins, and PCBs, may act like estrogen in the body. At present, these conclusions are preliminary and require much additional research.

Q: *What is the Division doing to control pollution caused by incinerators?*

A: The Division conducts a human health risk assessment to determine conditions for safely operating incinerators. The Division uses the risk assessment to set operating limits that are required in a permit. The permit gives the Division authority to levy fines, shutdown the incinerator, or take other legal avenues to ensure the operating limits are met. The Division monitors the incinerators to ensure their operations continue to be protective of human health and the environment.

Additional Information

If you would like more detailed information or have questions please contact:

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For additional fact sheets on *Health Risk Assessment, Hazardous Waste Permitting and Compliance, Chemical Agent Munitions Disposal System, Tooele Chemical Agent Disposal System, Chemical Agents, Hazardous Waste Incineration, Alternative Technologies, or Clean Up of Deseret Chemical Depot's Past Disposal Sites*.
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